



Attorney Docket No.: PATENT
SCI-00100

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:
James L. Hobart et al.
Serial No.: 09/018,104
Filed: February 3, 1998
For: **DUAL MODE LASER DELIVERY
SYSTEM PROVIDING
CONTROLLABLE DEPTH OF
TISSUE ABLATION AND
CORRESPONDING
CONTROLLABLE DEPTH OF
COAGULATION**

Group Art Unit: 3735

Examiner: Shay, D.

TRANSMITTAL LETTER

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Mail Stop Appeal Brief--Patents
Commissioner for Patents
P.O. Box 1450
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Sir:

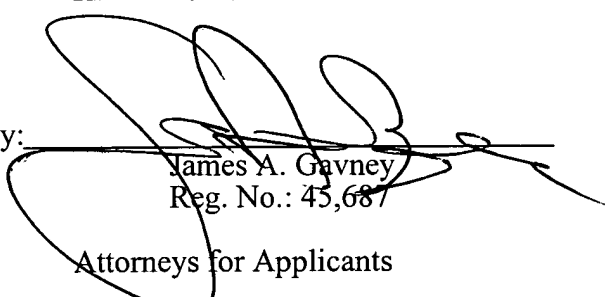
Enclosed please find a Reply Brief in triplicate in response to the Examiner's answer mailed on January 10, 2006 for filing with the U.S. Patent and Trademark Office.

The Commissioner is authorized to charge any additional fee or credit any overpayment to our Deposit Account No. 08-1275. **An originally executed duplicate of this transmittal is enclosed for this purpose.**

Respectfully submitted,
HAVERSTOCK & OWENS LLP

Dated: 3/10/2006

By:


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CERTIFICATE OF MAILING (37 CFR § 1.8(a))

I hereby certify that this paper (along with any referred to as being attached or enclosed) is being deposited with the U.S. Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to the: Commissioner for Patents, P.O. Box 1450 Alexandria, VA 22313-1450

- 1 -

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Date: 3/10/06 By: 



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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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| In re Application of: |) | Group Art Unit: 3735 |
| James L. Hobart et al. |) | Examiner: Shay, D. |
| Serial No.: 09/018,104 |) | REPLY BRIEF IN RESPONSE TO |
| Filed: February 3, 1998 |) | EXAMINER'S ANSWER |
| For: DUAL MODE LASER DELIVERY |) | |
| SYSTEM PROVIDING |) | |
| CONTROLLABLE DEPTH OF |) | 162 North Wolfe Road |
| TISSUE ABLATION AND |) | Sunnyvale, California 94086 |
| CORRESPONDING |) | (408) 530-9700 |
| CONTROLLABLE DEPTH OF |) | |
| COAGULATION |) | Customer No.: 28960 |

Mail Stop Appeal Brief
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In response to the Examiner's Answer, mailed January 10, 2006, this Reply Brief is submitted in triplicate. The Applicants submit this Reply Brief to the Board of Patent Appeals and Interferences in compliance with the requirements of 37 C.F.R. § 1.193(b).

I. THE PENDING ISSUES

Whether Claims 1, 11, 17 and 41 are improperly rejected under 35 U.S.C. § 102(b) and whether Claims 1-4, 6-14, 17-24, 41 and 44-52 are improperly rejected under 35 U.S.C. § 103(a).

Within the Examiner's Answer:

- Claims 1, 11, 17 and 41 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,125,922 to Dwyer et al. (hereafter "Dwyer").
- Claims 1-3, 8, 41, 43, 44 and 47-51 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,672,969 to Dew (hereinafter "Dew") in combination with, U.S. Patent No. 5,620,435 to Belkin et al. (hereinafter "Belkin") and the article titled "Selective Photothermolysis: Precise Microsurgery by Selective Absorption of Pulsed Radiation" by R. Rox Anderson and John A. Parrish (hereinafter "Anderson").
- Claims 1, 6, 7, 11-13, 17, 18, 41 and 44-46 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,098,426 to Sklar et al. (hereinafter "Sklar") in combination with Dwyer.
- Claims 4, 9, 10, 42 and 52 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Dew in combination with Anderson, Belkin and further in view of U.S. Patent No. 5,938,657 to Assa et al. (hereafter "Assa").
- Claims 14 and 19-22 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Dew in combination with Anderson and Belkin and further in view of Sklar.
- Claims 23 and 24 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Dew in combination with Anderson, Belkin, Sklar and further in view of Assa.

II. INTRODUCTION

The present invention is directed to a medical laser that uses laser pulses from each of the plurality of laser sources and combines the pulses or beams to form a laser output of the combined pulses or beams while the medical laser is in at least one of ablation mode or coagulation mode. In order to accomplish this goal, a galvanometer is preferably used to rapidly switch between the pulses or beams from each of the laser sources to combine the pulses or beams. Also, each of the lasers emits laser light having the same wavelength. Reference numbers for elements recited in the claims, illustrated in the figures and supported in the present specification, have been added below.

The elements recited in Claim 1 are illustrated in Fig. 3 and described in the corresponding text of the Specification on page 7, lines 8-28, and page 8, lines 1-2. Claim 1 recites a medical laser delivery apparatus for delivering a series of laser pulses having a wavelength, the medical laser delivery apparatus including non-ablative laser pulses for directing the laser pulses to an area of tissue to be treated and generating a region of coagulation to a controllable coagulation depth under a surface of the area of tissue, the apparatus comprising a laser source (31) for generating the series of laser pulses including the non-ablative laser pulses to be delivered to the area of tissue to be treated in order to raise a temperature at the surface of the area of tissue to be treated to a temperature sufficient to generate coagulation at the coagulation depth when the laser source is in a coagulation mode, wherein the laser source (31) comprises two or more lasers (32, 35) that combine the series of laser pulses (33, 35) from the two or more lasers (32, 35).

The elements recited in Claim 11 are illustrated in Figs. 3-4 and described in the corresponding text of the Specification on page 7, lines 8-28, and page 8, lines 1-14. Claim 11 recites a medical laser comprising a laser source having two or more pulsed lasers (32, 35) for generating pulses (33, 35) of laser light having a wavelength, wherein a series of the pulses of laser light are combined from the laser source (31) for generating a single laser output (37) having a predetermined absorption, wherein the predetermined absorption forms a predetermined coagulation depth and a laser control system (Fig. 4) coupled to the laser source for controlling the laser source (31) to deliver the laser output (37) to a target area (58).

The elements recited in Claim 17 are illustrated in Figs. 3-4 and described in the corresponding text of the Specification on page 7, lines 8-28 and page 8, lines 1-14. Claim 17 recites a medical laser delivery apparatus for treating an area of tissue comprising a laser source (31) having a first laser (32) and a second laser (34) each of which generates laser pulses (33, 35) having a wavelength, the laser source (31) being configured to combine laser pulses of the first laser (32) and the second laser (34) to form a single laser output (37) by a combining apparatus (36) for delivering a series of laser pulses each having a strength and a duration to ablate or coagulate the area of tissue (58) being treated, a laser delivery system (38) coupled to the laser source (31) for delivering the laser pulses from the laser source (31) to the area of tissue (58) being treated and a control system (Fig. 4) for selecting the rate and fluence of the laser pulses, the control system coupled to the laser source for controlling generation of the laser pulses from the laser source, wherein the laser source operates in both an ablation mode and a coagulation mode such that when in the ablation mode, the strength and duration of the laser pulses are

sufficient to ablate tissue at the area of tissue being treated to a controllable ablation depth and when in the coagulation mode, the strength and duration of the laser pulses are sufficient to generate a coagulation region having a controllable coagulation depth within the tissue remaining at the area of tissue being treated without ablating any tissue.

The elements recited in Claim 41 are illustrated in Fig. 3 and described in the corresponding text of the Specification on page 7, lines 8-28, and page 8, lines 1-2. Claim 41 recites a dual mode medical laser system, for sequentially ablating and coagulating a region of target tissue with ablation laser pulses followed by coagulation laser pulses, the dual mode medical laser system comprising a laser source (31) comprising a first laser (32) and a second laser (34) for generating a first set of laser pulses (33) and a second set of laser pulses (35) at a wavelength means to combine pulses (31) of the first set of laser pulses (33) and the second set of laser pulses (35) to provide a single laser output (37), the single laser output (37) being capable of coagulating tissue with the system in a coagulation mode and ablating tissue with the system in an ablating mode and means to direct (38) the single laser output (37) to the region of the target tissue (58).

The elements recited in Claim 50 are illustrated in Fig. 3 and described in the corresponding text of the Specification on page 7, lines 8-28, and page 8, lines 1-2. Claim 50 recites a medical laser delivery apparatus for delivering a series of laser pulses (37) having a wavelength, the medical laser delivery apparatus including non-ablative laser pulses for directing to an area of tissue (58) to be treated and generating a region of coagulation to a controllable coagulation depth under a surface of the area of tissue (58), the apparatus comprising a laser source (31) for generating the series of laser pulses including the non-ablative laser pulses to be delivered to the area of tissue (58) to be treated in order to raise a temperature at the surface of the area of tissue to be treated to a temperature sufficient to generate coagulation at the coagulation depth when the laser source (31) is in a coagulation mode, wherein the laser source (31) comprises two or more lasers (32, 34), the medical laser delivery apparatus further comprising a galvanometer (36) that combines the series of laser pulses from the two or more lasers (32, 34) into a single laser output (37) by switching between laser outputs (33, 35) from the two or more lasers (32, 34).

The elements recited in Claim 51 are illustrated in Figs. 3-4 and described in the corresponding text of the Specification on page 7, lines 8-28, and page 8, lines 1-14.. Claim 51 recites a medical laser comprising a laser source (31) having two or more pulsed lasers (32, 34) for generating laser outputs (33, 35) having a wavelength, wherein a series of the pulses of laser

light are combined into a single laser output (37) by switching between the laser outputs (33, 35) with a galvanometer (36), the single laser output (37) having a predetermined absorption, wherein the predetermined absorption forms a predetermined coagulation depth and a laser control system (Fig. 4) coupled to the laser source for controlling the laser source (31) to deliver the laser output to a target area.

III. ARGUMENT

A. THE GROUNDS FOR REJECTION ARE ESSENTIALLY
THOSE FROM THE FINAL OFFICE ACTION AND HAVE BEEN
RESPONDED TO IN THE APPEAL BRIEF.

Within the Examiner's Answer, the section titled "Grounds of Rejection" repeats the grounds for rejection set forth in the final Office Action mailed on April 7, 2005, and adds some additional grounds for rejection not previously addressed. The Applicants' response to these arguments was stated in the Applicants' Appeal Brief, filed on October 5, 2005, and will not be repeated in their entirety here.

Briefly, it is stated in the Examiner's Answer that Dwyer teaches two lasers whose outputs are combined at a **beam splitter**. However, a beam splitter is for separating or splitting light from a single beam into multiple outputs, not combining laser pulses from two multiple laser beams to generate a single laser output, as with the claimed invention.

Further it is stated in the Examiner's Answer in response to the Applicant's arguments that the laser system of Dwyer cannot operate to switch between laser sources on a laser-pulse time scale is unfounded because a time scale is not recited in the claims and that the claims only specify that some pulse come from one laser and some pulses come from the other lasers. The timescale issue was not raised during the prosecution of the Application for patent, such as to allow the Appellants the opportunity to amend the Claims to include such limitations. Nevertheless, Appellants contend that the rejection of Claims 1, 11, 17 and 41 under 35 U.S.C. § 102(b) as being anticipated by Dwyer is improper because the rejection fails to consider Claims 1, 11, 17 and 41 in their entireties. Specially, each of the independent Claims 1, 11, 17 and 41 clearly recites generating a single laser output by combining pulses from multiple laser sources with the same wavelength in a single operation. Such a single laser output could not be generated by the laser system of Dwyer using a beam splitter regardless of the time scale.

B. THE COMBINATION OF DEW, BELKIN, AND ANDERSON
DOES NOT RENDER CLAIMS 1-3, 8, 41, 43, 44 AND 47-51 OBVIOUS.

1. The Examiner's Answer does not overcome the assertions that one skilled in the art would find the invention of the '104 application is nonobvious.

Within the Examiner's Answer, Claims 1-3, 8, 41, 43, 44 and 47-51 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Dew in combination with Belkin and Anderson. In the Examiner's Answer it is stated that Dew teaches a carbon dioxide laser and a laser system with multiple lasers, Belkin teaches a carbon dioxide laser that can be used to heat tissue rather than cut tissue, and Anderson teaches laser parameters for controlled absorption of laser radiation by the tissue. Accordingly, it is concluded that Dew in combination with Belkin and Anderson would produce the Claimed invention.

Appellants content that neither Dew, nor Belkin, nor Anderson, nor their combination teaches or suggests a medical laser with a laser source having two or more lasers having a wavelength, wherein pluses from the two or more lasers are combined for generating a laser output at the wavelength while operating in at least one of the ablation mode and coagulation mode or means for combining pulses from the two or more lasers. These features, as well as other distinguishing features, are recited in the independent Claims 1, 41, 50 and 51. For at least these reasons, Claims 1, 41, 50 and 51 are allowable over the teachings of Dew, Belkin, Anderson and their combination.

Claims 2, 3 and 8 are all dependent on the independent Claim 1; Claims 43, 44 and 47-49 are all dependent on the independent Claim 41. As described above, the independent Claims 1 and 41 are allowable over the teachings of Dew, Belkin, Anderson and their combination. Accordingly, Claims 2, 3, 8, 43, 44 and 47-49 are also all allowable as being dependent upon allowable base claims.

C. THE COMBINATION OF SKLAR AND DWYER
DOES NOT RENDER CLAIMS 1, 6, 7, 11-13, 17, 18, 41 and 44-46 OBVIOUS.

1. The Examiner's Answer does not overcome the assertions that one skilled in the art would find the invention of the '104 application is nonobvious. _____

Within the Examiner's Answer, Claims 1, 6, 7, 11-13, 17, 18, 41 and 44-46 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Sklar in combination with Dwyer. In the Examiner's Answer it is stated that Sklar teaches a graphical user interface with multiple lasers that can be used with any type of laser and that Dwyer teaches a dual laser system with controllable spot size. Accordingly, it is concluded that Sklar in combination with Dwyer would produce the claimed invention.

Appellants content that neither Sklar, nor Dwyer nor their combination teaches or suggests combining laser pulses from a laser source comprising two or more lasers having a wavelength to generate a single laser output for coagulating or ablating tissue. These features, as well as other distinguishing features, are recited in the independent Claims 1, 11, 17 and 41. For at least these reasons, the independent Claims 1, 11, 17 and 41 are allowable over the teachings of Sklar, Dwyer and their combination.

Claims 6 and 7 are both dependent on the independent Claim 1; Claims 12 and 13 are both dependent on the independent Claim 11; Claim 18 is dependent on the independent Claim 17; Claims 44-46 are all dependent on the independent Claim 41. As described above, the independent Claims 1, 11, 17 and 41 are allowable over the teachings of Sklar, Dwyer and their combination. Accordingly, Claims 6, 7, 12, 13, 18 and 44-46 are also all allowable as being dependent upon allowable base claims.

D. THE COMBINATION OF DEW, ANDERSON, BELKIN, AND ASSA DOES NOT RENDER CLAIMS 4, 9, 10, 42 AND 52 OBVIOUS.

1. The Examiner's Answer does not overcome the assertions that one skilled in the art would find the invention of the '104 application is nonobvious. _____

Within the Examiner's Answer, Claims 4, 9, 10, 42 and 52 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Dew in combination with Anderson, Belkin and Assa. In the Examiner's Answer it is stated that Assa teaches a scanning hand piece and the equivalence of carbon dioxide and Erbium YAG lasers. Accordingly, it is concluded that Dew in combination with Anderson, Belkin and Assa would produce the claimed invention.

Appellants content that, the inordinate number of combined references is inconsistent with establishing a prima facie case of obviousness. Regardless, the combination Dew of Anderson, Belkin and Assa fails to teach the invention as claimed in both the independent Claims 1 and 41.

Claims 4, 9, 10 and 52 are all dependent on the independent Claim 1, and Claim 42 is dependent on the independent Claim 41. As described above, the independent Claims 1 and 41 are both allowable over the teachings of Dew, Anderson, Belkin, Assa and their combination. Accordingly, Claims 4, 9, 10, and 52 are also all allowable as being dependent upon allowable base claims.

E. THE COMBINATION OF DEW, ANDERSON BELKIN AND SKLAR DOES NOT RENDER CLAIMS 14 and 19-22 OBVIOUS.

1. The Examiner's Answer does not overcome the assertions that one skilled in the art would find the invention of the '104 application is nonobvious. _____

Within the Examiner's Answer Claims 14 and 19-22 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Dew in combination with Anderson, Belkin and further in view of Sklar. In the Examiner's Answer it is stated that Sklar teaches an interface for use with a multi-laser system. Accordingly, it is concluded that Dew in combination with Anderson, Belkin and Sklar would produce the claimed invention.

Appellants contend that for all the reasons above, neither Dew, nor Anderson, nor Belkin, nor Sklar nor their combination teaches or suggests a medical laser comprising a laser source having two or more pulsed lasers for generating pulses of laser light having a wavelength, wherein a series of the pulses of laser light are combined from the laser source for generating a single laser output, such as recited in the independent Claim 11.

Claims 14 and 19-22 are all dependent on the independent Claim 11. As described above, the independent Claim 11 is allowable over the teachings of Dew, Anderson, Belkin, Sklar and their combination. Accordingly, Claims 14 and 19-22 are also all allowable as being dependent on an allowable base claim.

E. THE COMBINATION OF DEW, ANDERSON BELKIN, SKLAR, AND ASSA DOES NOT RENDER CLAIMS 23 AND 24 OBVIOUS.

1. The Examiner's Answer does not overcome the assertions that one skilled in the art would find the invention of the '104 application is nonobvious.

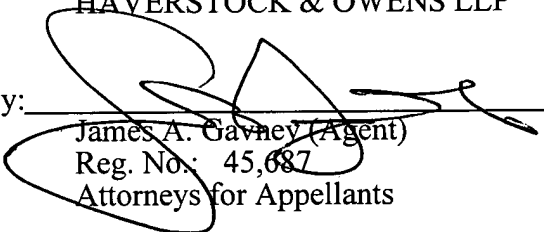
Within the Examiner's Answer, Claims 23 and 24 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Dew in combination with Anderson, Belkin, Sklar and further in view of Assa. Within the Examiner's Answer it stated that the motivation for the combination has been iterated above. Again, while the Appellants contend that there is no motivation for the combination of such a large number of references, the combination nevertheless fails to teach the claimed invention. The independent Claim 17 recites a medical laser delivery apparatus for treating an area of tissue comprising a laser source having a first laser and a second laser each of which generated laser pulses having a wavelength, the laser source being configured to combine laser pulses of the first laser and the second laser to form a single laser output. Neither Dew, nor Anderson, nor Belkin, nor Sklar, nor Assa nor their combination teaches or suggests such as laser system. For at least these reasons, the independent Claim 17 is allowable over the teachings of Dew, Anderson, Belkin, Sklar, Assa et al. and their combination.

Claims 23 and 24 are both dependent on the independent Claim 17. As described above, the independent Claim 17 is allowable over the teachings of Dew, Anderson, Belkin, Sklar, Assa and their combination. Accordingly, Claims 23 and 24 are also both allowable as being dependent on an allowable base claim.

III. **CONCLUSION**

None of the primary references used to reject the independent Claims 1, 11, 17, 41 50 and 51 alone or in combination teach or suggest the invention being claimed. Appellants contend that Dwyer teaches a laser system with a prism or beam splitter for separating wavelengths from a laser beam and not for combining laser beams from multiple laser sources to generate a single laser output. Dew teaches a laser system with multiple lasers that are used independently and fails to teach or suggest combining laser beams, either with the same or different wavelengths, to generate a single laser output. For the above reasons, it is respectfully submitted that the Claims 1-4, 6-14, 17-24, 41 and 44-52 are allowable over the cited prior art references. Therefore, a favorable indication is respectfully requested.

Dated: 3/10/2006

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